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LECTOTYPIFICATION OF *CASTILLEJA BREVIFLORA* A. GRAY NON BENTH. AND ITS IMPORTANCE TO THE NOMENCLATURE OF *CASTILLEJA PUBERULA* RYDB. (OROBANCHACEAE)

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ABSTRACT

Lectotypification of the illegitimate name *Castilleja brevifllora* A. Gray 1862 (non Benth. 1846) is proposed in order to maintain *Castilleja puberula* Rydb. and to resolve the heterotypy of *C. breviflora* A. Gray. *Castilleja breviflora* A. Gray is then formally placed in synonymy under *Castilleja flava* S. Wats.

KEY WORDS: Orobanchaceae, Castillejinae, *Castilleja, Castilleja brachyantha* Rydb., *Castilleja breviflora* A. Gray, *Castilleja puberula* Rydb., *Castilleja flava* S. Wats., lectotypification, nomenclature, heterotype

When A. Gray first published *Castilleja breviflora* A. Gray (in 1862), he was unaware that G. Bentham (in 1846) applied this name in *Castilleja* to a species of Andean South America. Rydberg later realized this and in 1900 published the name *Castilleja brachyantha* Rydb. to replace Gray's name. Still later, in 1905, Rydberg described the morphologically similar *Castilleja puberula* Rydb., clearly implying that he regarded the two as different species. Eventually, *C. brachyantha* was reduced to synonymy under *Castilleja flava* S. Wats. by Harrington (1954), while *C. puberula* continues to be recognized as a bona fide species (e.g., Nelson & Harmon 1997; Seagrist & Taylor 1998; Beidleman et al 2000; Hartman & Nelson 2001; Weber & Wittmann 2012). *Castilleja flava* is a widespread species of moderately xeric habitats at middle elevations throughout much of the Intermountain West and is often associated with sagebrush communities. *Castilleja puberula* is an uncommon to rare alpine species endemic to four counties in the central Rocky Mountains of Colorado and likely evolved as a high elevation isolate of *C. flava*.

When Gray established his *Castilleja breviflora*, he cited two elements, Pl. Parry, No. 243 (1861, headwaters of Clear Creek and the alpine ridges lying east of Middle Park, Colorado Territory, duplicates at DUKE!, GH!, IA-ISC!, NY!, P!) and an unpublished T. Nuttall name, "*Euchroma breviflora*, Nutt. *in* herb. Philad." Based on the known range of the plant in question, Nuttall gathered his specimens in Idaho or Wyoming in 1834. Sheets bearing this name in Nuttall's hand (BM!, PH!) are clearly referable to *C. flava*, while sheets of *Parry 243* all bear plants identical to what is now recognized as *C. puberula*. This case of heterotypy complicates the modern usage of the name *C. puberula*, necessitating the lectotypification proposed below.

Based on the fact that only *Parry 243* is located at GH and is annotated by Gray as his *Castilleja breviflora*, it is likely the meager description in the protologue was based primarily on the Parry collection (Fig. 1). While most of the description could apply to either *C. flava* or *C. puberula*, Gray does mention that the plants are "spithamæa" or only one "hand-span" in height, the typical height of most flowering *C. puberula* plants (Fig. 2) but shorter than most *C. flava* plants of similar development (Fig. 3). However, we know that Gray studied at least the BM specimen of *Nuttall s.n.*, because it bears an annotation in his hand, "*Castilleja. Euchroma breviflora*, Nutt., ined." (Fig. 4). That sheet contains one large, typical stem of *C. flava* but also several, much shorter, poorly

developed or trimmed stems that may have influenced Gray's description as well. Also, according to Pennell (1936) it is likely Gray saw the PH specimen of *Nuttall s.n.*, though it lacks his annotation (Fig. 5).

Until now Gray's *Castilleja breviflora* has not been lectotypified. Apparently, Harrington (1954) was the first to assign *C. brachyantha* to synonymy under *C. flava,* even though that species only partially corresponds to Gray's description of *C. breviflora.* Most authors working with the Rocky Mountain flora later adopted Harrington's synonymy. The isolectotype designated below was also annotated as *C. flava* by *Castilleja* authority F.W. Pennell in 1920.

It should be noted that Rydberg's application of *Castilleja brachyantha* is somewhat different from that intended by Gray when he proposed his *C. breviflora.* Aside from linking his new name *C. brachyantha* with Gray's illegitimate *C. breviflora*, Rydberg (1900) cited only a single collection (*P. Koch 10*, Hoodoo Peak, Yellowstone National Park, Wyoming). This collection does not appear to be present at RM at this time, and its true identity has yet to be determined. However, I know of no verified specimens of *C. puberula* from either Montana or Wyoming, and the region in which *Koch 10* was collected is well within the known range of *C. flava* (Holmgren 1984). In Rydberg's works published prior to the description of *C. puberula*, *C. brachyantha* was distinguished from *C. flava* by minor variations in the lower corolla lip. Following the publication of *C. puberula*, Rydberg (1906, 1917) distinguished *C. brachyantha* from both *C. puberula* and *C. flava* based on stature and differences in the structure of the beak and lower lip of the corolla, but his application of the name *C. brachyantha* appears to most closely match plants now treated as *C. flava.*

Typification of Gray's *Castillja breviflora* with Nuttall's collection will assure that *C. puberula*, a name in current use, will remain available for this rare Rocky Mountain plant, as *C. puberula* was described after both Gray's name and Rydberg's replacement name. This is not a concern with *C. flava*, which was described in 1871, well before Rydberg's *C. brachyantha.*

CASTILLEJA FLAVA S. Wats. in King, Rep. Geol. Explor. 40th Parallel [Botany] 5: 230. 1871. **TYPE**: **Utah**. [Rich Co.:] Upper Bear River Valley, 7000 ft, Jul 1869, *S. Watson 813* (holotype: GH!, isotypes: NY!, US!, YU!).

Castilleja breviflora A. Gray, Amer. J. Sci. 34: 338. 1862. *Castilleja brachyantha* Rydb., Mem. N.Y. Bot. Gard. 1: 360. 1900 (replacement name, not *Castilleja breviflora* Benth. in DC., Prodr. 10: 534. 1846). **LECTOTYPE** (designated here): **USA. [Idaho** or **Wyoming]**. Rocky Mts., 1834, *T. Nuttall s.n.* (BM!, isolectotype: PH!).

CASTILLEJA PUBERULA Rydb., Bull. Torrey Bot. Club 31: 644. 1905. **TYPE**: **Colorado**. "Colorado Territory," 1872, *C.C. Parry s.n.* (holotype: NY!, isotypes: GH!, P!, PH!),

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Figure 1. Mixed sheet at GH containing several collection of *Castilleja puberula*, including both an isotype of *C. puberula* Rydb. and a syntype of *C. breviflora* A. Gray. Note that both my annotation from 1996 and some of those by others are not fully accurate and that only the stems in the lower left obtained by Parry in 1861 actually represent *Parry 243*.

Figure 2. *Castilleja puberula* Rydb., Mt. Goliath Natural Area, Mt. Evans, Clear Creek Co., CO, 11 July 1989, *M. Egger 272*, WTU.

Figure 3. *Castilleja flava* var. *flava*, Angel Lake Road, East Humboldt Range, Elko Co., NV, 27 Jun 1995, *M. Egger 688*, WTU.

Figure 4. Proposed hololectotype of *Castilleja breviflora* A. Gray, *Nuttall s.n.*, BM. The collection is of the entity now known as *C. flava* S. Watson. Note Gray's faint annotation in pencil near the bottom edge of the sheet.

Figure 5. Isolectotype of *Castilleja breviflora* A. Gray, *Nuttall s.n.*, PH. The collection is of the entity now known as *C. flava* S. Watson, as annotated in Pennell in 1921.

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